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(54) Title: POLYETHYLENE BLOW MOLDING COMPOSITION FOR PRODUCING LARGE CONTAINERS

(57) Abstract: The invention relates to a polyethylene composition with multimodal molecular mass distribution, which is particularly suitable for the blow molding of large containers with a volume in the range of from 10 to 150 dm³ (I). The composition has a density in the range of from 0.949 to 0.955g/cm³ at 23 °C and an MFI_{190/5} in the range of from 0.1 to 0.3 dg/min. It comprises from 38 to 45 % by weight of a low-molecular-mass ethylene homopolymer A, from 30 to 40 % by weight of a high-molecular-mass copolymer B made from ethylene and from another 1-olefin having from 4 to 8 carbon atoms, and from 18 to 26 % by weight of an ultrahigh-molecular-mass ethylene copolymer C.

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INTERNATIONAL SEARCH REPORT



Application No

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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C08L23/04 C08F297/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C08L C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 199 45 980 A (ELENAC GMBH) 29 March 2001 (2001-03-29) the whole document	1-10
X	US 4 536 550 A (IKEGAMI TADASHI ET AL) 20 August 1985 (1985-08-20) the whole document	1-10
X	US 4 336 352 A (SAKURAI HISAYA ET AL) 22 June 1982 (1982-06-22) the whole document	1-10
A	US 6 242 548 B1 (KASPAR HARALD ET AL) 5 June 2001 (2001-06-05) the whole document	1-10
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☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>EP 0 603 935 A (SOLVAY) 29 June 1994 (1994-06-29) cited in the application the whole document</p>	1-10

INTERNATIONAL SEARCH REPORT

Application No

03/13975

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 19945980	A	29-03-2001	DE 19945980 A1	29-03-2001
			AT 244264 T	15-07-2003
			AU 769434 B2	29-01-2004
			AU 7001700 A	30-04-2001
			BR 0014232 A	04-06-2002
			CA 2387708 A1	05-04-2001
			CN 1376170 T	23-10-2002
			DE 50002772 D1	07-08-2003
			WO 0123446 A1	05-04-2001
			EP 1228101 A1	07-08-2002
			JP 2003510429 T	18-03-2003
US 4536550	A	20-08-1985	JP 1012777 B	02-03-1989
			JP 1612249 C	30-07-1991
			JP 59196345 A	07-11-1984
			JP 1012778 B	02-03-1989
			JP 1612250 C	30-07-1991
			JP 59196346 A	07-11-1984
			JP 60036546 A	25-02-1985
			JP 1012781 B	02-03-1989
			JP 1612255 C	30-07-1991
			JP 60036547 A	25-02-1985
			CA 1218181 A1	17-02-1987
			DE 3470168 D1	05-05-1988
			EP 0129312 A1	27-12-1984
US 4336352	A	22-06-1982	JP 1282819 C	27-09-1985
			JP 56032506 A	02-04-1981
			JP 59010724 B	10-03-1984
			BE 884866 A1	16-12-1980
			BR 8005307 A	04-03-1981
			CA 1138148 A1	21-12-1982
			DE 3031540 A1	09-04-1981
			FR 2463791 A1	27-02-1981
			GB 2056996 A ,B	25-03-1981
			IT 1193551 B	08-07-1988
			NL 8004745 A ,C	26-02-1981
US 6242548	B1	05-06-2001	AU 6044399 A	05-12-2000
			CA 2372222 A1	23-11-2000
			EP 1185583 A1	13-03-2002
			WO 0069969 A1	23-11-2000
EP 0603935	A	29-06-1994	BE 1006439 A3	30-08-1994
			AT 191724 T	15-04-2000
			AU 670976 B2	08-08-1996
			AU 5249693 A	30-06-1994
			BR 9305106 A	28-06-1994
			CZ 9302853 A3	13-07-1994
			DE 69328345 D1	18-05-2000
			DE 69328345 T2	07-12-2000
			EP 1364971 A2	26-11-2003
			EP 0603935 A1	29-06-1994
			EP 0940411 A2	08-09-1999
			ES 2147192 T3	01-09-2000
			FI 935772 A	22-06-1994
			GR 3033922 T3	30-11-2000
			HU 66491 A2	28-11-1994

INTERNATIONAL SEARCH REPORT

International application No
EP 03/13975

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0603935	A	NO 934729 A	22-06-1994
		PL 301589 A1	27-06-1994
		PT 603935 T	31-10-2000
		US 6344522 B1	05-02-2002
		US 6407185 B1	18-06-2002
		US 6136924 A	24-10-2000
		ZA 9309588 A	11-08-1994
